

ABSTRACT

Coccolithophorids and diatoms are among the most abundant groups of marine phytoplankton and are significant primary producers and components of biogeochemical cycles. Both groups are also capable of biomineralization and form specific shells. Studies of coccolithophorid and their viruses focus only on the species *Gephyrocapsa huxleyi*, while studies of diatoms mainly focus on species of the genus *Chaetoceros*. *Gephyrocapsa huxleyi* is primarily known in its diploid form, which carries calcified coccoliths on its surface. By changing ploidy (or at least phenotype), it also forms a less-known haploid form (or a diploid form with a haploid phenotype), which is capable of resisting viral infection. Diatoms of the genus *Chaetoceros* possess the typical siliceous shell of diatoms and have a diplontic life cycle. In the presence of viral infection, they form thick-walled spores that are resistant to viral infection and can survive the viral outbreak until favorable conditions are restored, during which they germinate without triggering the infection.

Although the defenses against viral infection in coccolithophorids and diatoms differ in many aspects, such as the type of viral genome, the effectiveness of the shell in preventing infection, or the type of resistant life form, there are certain similarities between them. Analogies include, for example, the induction of a change in the viral life cycle from acute lytic infection to a latent form. This is related to the presence of resistant forms that are not capable of preventing the entry of the virus into the cell but successfully prevent cell lysis, thereby stopping the release and spread of new virions. Furthermore, similarities include the influence of bacterial communities associated with the phytoplankton species on resistance. Lastly, coccolithophores and diatoms share the common issue of insufficient interest in the study of viruses and their underestimation in terms of number and significance.